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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G06K 15/00		A1	(11) International Publication Number: WO 99/30273
			(43) International Publication Date: 17 June 1999 (17.06.99)
(21) International Application Number: PCT/US98/25870			(81) Designated States: CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
(22) International Filing Date: 4 December 1998 (04.12.98)			
(30) Priority Data: 60/067,616 5 December 1997 (05.12.97) US 60/078,327 17 March 1998 (17.03.98) US			
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Published With international search report.			

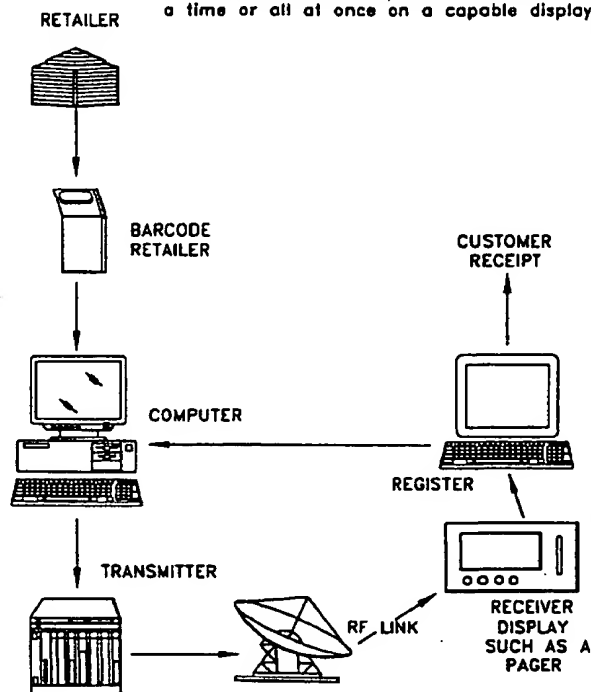
(54) Title: WIRELESS SALES PROMOTION SYSTEM

(57) Abstract

A method and apparatus for providing information to a subscriber includes a memory for storing information relative to the subscriber, a detector for detecting the presence of the subscriber at a location, such as a retail establishment, and a transmitter for transmitting information stored in the memory to the subscriber at the location in response to the detection of the subscriber. The system is also capable of communicating transactional information to a subscriber in response to the detection of a subscriber inquiry.

SIPS
BASIC RETAILER SYSTEM

This is an example of a SIPS system operation. The promotional information flows in one direction to the consumer. Multiple incentives are possible one at a time or all at once on a capable display.



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Wireless Sales Promotion System

Field of the Invention

The invention relates generally to systems for the discounting of products with coupons.

5 Background of the Invention

The prior art is primarily focused on the discounting of products with coupons. These coupons are intended to cause customers to go to the store to purchase products in which they may not normally be interested. This industry has existed for over 100 years and is presently over a billion dollar in revenues. The cost of the coupon system
10 operation is also very high and has many support participants providing various services to support the entire system. These participants service costs are printing of the coupons, retailers time in handling, clearing house services, re-reimbursement operations, and more. The system has been under fire by the manufacturers for many years, because of the systems inherently inefficient operations.

15 Brief Description of the Drawings

The present invention will be better understood, and its numerous objects and advantages will become apparent to those skilled in the art by reference to the following detailed description of the invention when taken in conjunction with the following drawings, in which:

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Fig. 1 is a diagrammatic view of a retail system constructed in accordance with the invention;

Fig. 2a is a flow diagram of a basic multi-system constructed in accordance with the invention;

5 Fig. 2b is a flow diagram of a complex multi-system constructed in accordance with the invention;

Fig. 3 is a flow diagram of a basic multi-function system constructed in accordance with the invention;

Fig 4 is a diagrammatic view of a dual receiver system site;

10 Fig. 5 is a diagrammatic view of a single receiver system site;

Fig. 6 is a diagrammatic view of a pager device for use in a dual receiver system;

Fig. 7 is a diagrammatic view of a pager device for use in a single receiver system;

15 Fig 8 is a diagrammatic view of a single mutiplexed receiver system site; and

Fig. 9 is a diagrammatic view of pager device for use with a single mutiplexed receiver.

Detailed Description

This novel invention is a new means of stimulating customers to purchase products while at the store. The various support participants that are required in the existing couponing system have no function in this system. The removal of these system support participants
5 make for a very simple and cost effective operation providing customer sales stimulation. This invention operates at the retailers premises and is able to be controlled by the retailer. The system is wireless and is capable of addressing the customer as an individual, with promotions focused to the specific customer. This means that the promotions can be tailored to the particular interests of each customer, and may be changed instantly.

10 System Operation Summary

This new and novel sales stimulation system operates to make each of the retailer's customers aware of sales and or opportunities that may be available either from the retailer or the manufacturer. This is the preferred operation and not intended to be limiting to only the process herein. The customer has obtained a wireless device which may
15 be a pager. These pager devices are generally used to contact a person with a message which is displayed on a contained screen. In this invention the pager device is used to inform the customer of sales or any aspect of potential interest that may cause the customer to purchase a product or products. When the customer enters the retailers premises the customer places the pager device in front of a barcode scanner located near the entrance
20 way. The barcode provides the customer identification to a computer system potentially located at the retailers site, as to who the customer is and that they are now on the premises. The receipt of this customer ID causes the computer system software to locate the customers account record. The customer has prior registration with a membership program, establishing a computer record used to track the customer and their buying habits.
25 The buying habits of the customer may be used to determine what the retailer desires to offer the customer as a reward or promotion to purchase products. Once the customer record is accessed to determined a reward or promotion, this reward or promotion is transmitted from a local limited range in-house transmitter to that customers pager device. The pager device alerts the customer by an audible alarm or vibration. The customer may
30 then view the transmitted reward or promotion information for consideration. There may

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be many offers to the customer and they may be viewed by scrolling them on the pager device display.

Detail

When the customer enters the store they hold the pager in front of a barcode reader. This barcode is the customers universal ID. The customer has a prior registration record which is compared against the scanned barcode. The tells the store computer that this particular customer has entered the store. The customer record may contain any information of interest, but contains at least a complete profile of a customer. The store computer then sends offers of interest to the customers pager, where they may be viewed.

10 The customer may then select the promoted product and take it to the check-out counter. The customer may then scan the pager barcode or store card at the register and receive promotion credits towards those products. The resultant data acquired from the customer use of this system is accumulated on the computer that may be located on the retailers premises. New and novel data, heretofore not available, can be aggregated, amalgamated,

15 and analyzed. It is also within the purview of this invention that questions provided on the pager device may be asked of the customer, pertaining to products, services, etc., whose answers may yield important and valuable information. The answers may be entered on a type of pager device equipped with appropriate data entry keypad or touch screen or any other method. In this instance the pager device will be of the two way communications

20 type, which has recently become available in the market. The new type of information for example may address how long it took the customer to purchase the product after being paged with that promotion, how many additional products were also purchased, how long the customer stayed in the store, etc. This information has not been available because no such promotion system has existed before this new invention, capable of providing

25 immediate communications on the premises. Presently, loudspeaker promotion announcements to the general personage are used, but without follow-up or correlation to a specific customer with a specific individual promotion. This invention can offer custom promotions to specific customers, without the knowledge or participation of any other customer. This allows for "stimulus and response" studies with very carefully designed

30 controlled structures. This system is simple and unobtrusive, and may be operable in store environments that would not be receptive to other promotion methods. For example, the

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major department stores would not provide coupons in the various departments as is done in food markets. Food markets are seen as utilitarian and coupons offered in this environment are acceptable. In a department store such as Bloomingdales this type of display would be seen as denigrating the ambiance and quality or caliber of product or store presentation. Because of the personal manner in which this system may be operated customers may be addressed with "personal" attention, rather than en masse. This new approach to sales promotion may now be applied to all the various markets that have previously shied away from present methodologies.

Another consideration of operation is, while driving past various establishments having limited range transmitters on the premises the pager may alert the driver as to that establishments promotion. An example: driving with-in range of a Pizza Hut may cause the drivers pager device to display the message "wouldn't you like a pizza right now --- your within 5 minutes of Pizza Hut --- take one home for dinner". There can also be distinct levels of promotion acceptance so as to provide for the blocking of undesired types of promotions. An access for personal paging may be separate from Pizza Hut promotions, providing for blocking of promotions from fast food establishments as you drive past them.

This system design may be comprised of many different and distinct hardware and software arrangements functioning to address unique requirements and environments. The first example (Fig 1) shows a simple arrangement of hardware and software operations. This example could be applied to a smaller sales environment. The second example (Fig 2a) is applied to a large sales environment comprised of many stores. A second large system example (Fig 2b) demonstrates another possible arrangement.

A third example (Fig 3) may be comprised of a two way pager able to receive promotions from the Internet. The consumer may connect to the Internet, make selections of products on the screen, answer questions, or interact in any manner designed to communicate information, and these activities may generate communications to the consumers pager device. When the consumer enters any store of choice the two way pager device may alert the computer potentially located on the store premises as to which consumer has arrived. The computer may then access the Internet in order to retrieve the specific store promotions available to this consumer. An alternate method may be that the

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pager device may be triggered by any means upon entry to the store to wirelessly communicate with the Internet in order to retrieve this consumers promotions. The store may also offer additional promotions transmitting directly to the pager device upon entry to the store premises or by posting the promotionals on the Internet. Any information
5 contained or retained with the pager device may be transferred to the computer potentially located on the store premises by radio frequency transmission, infrared communications, or by any other suitable means. The purpose of this information transfer is to convey information that may benefit the consumer, the store, and or the system provider. The system provider may desire to analyze the information derived from the pager device use
10 and activities and sell the information or any other transaction to derive value beyond the direct functions and operations contained herein. Additionally, any reference to the Internet may pertain to any public access network. Internet users/consumers may also utilize incentive software on their computer and communicate the their information to the retailer by way of a public paging service. The incentive software provides promotions that the
15 users/consumers may select and respond to any questions, and answering the questions may increase the incentive value. The answers may be carried to the retailer by way of the Internet or by way of the pager device. The incentive software may also be used online on the Internet, with incentives and answers being made available to the retailer by way of Internet access by the retailer. The store system of communications to the pager device,
20 the Internet, and or any other network system may be considered to be a private access network. Additionally, many store private networks may be connected to comprise a larger network, and or with public networks.

Invention Description

This new and novel invention is a new means of stimulating customers to
25 purchase products while at a store. The various participants that are required in the existing couponing system have no function in this new system. The removal of these support participants make for a very simple and cost effective system providing for customer sales stimulation. This invention operates at the retailers premises, and is able to be controlled by the retailer. The system is wireless and is capable of addressing the customer as an
30 individual, with promotions focused to each specific customer. This means that the

promotions can be tailored to the particular customers unique interests, and be changed immediately by the retailer, manufacturer, or anyone having access to the system computer.

System Operation

This new and novel sales promotion system operates to make each customer
5 aware of sales or opportunities that may be available, either from the retailer, manufacturer, or any other source. This is the preferred operation and not intended to limit operations to only the process herein. In use, the customer obtains a wireless device which may be similar to a pager. Pager devices are generally used to contact a person with a message which is displayed on a contained screen. In this invention the pager is used to inform the
10 customer of sales or any aspect of potential interest that may cause the customer to purchase a product(s) or service(s). When the customer enters the retailers premises, passing sensors capable of detecting code(s) of the pager, the code(s) are passed to these sensors for use by the system. These codes may be in the form of barcodes, and represent the customers identification, alerting the retailers computer system as to the specific customer now on the
15 retailers premises. The receipt of this customer ID causes the computer system software to locate the customers account record. The customer has prior registration with the retailer, establishing a computer record used to track buying habits. The buying habits of the customer may be used to determine what the retailer decides to offer the customer as a reward or promotion to purchase products. Once the customer record is accessed to
20 determine their reward or promotion, the reward or promotion is transmitted from a local limited range in-house transmitter to that customers pager. The pager alerts the customer by an audible alarm or vibration. The customer may then view the transmitted information for consideration. There may be many offers to the customer and they may be viewed by scrolling them on the pager display.

25 In summary, when the customer enters the store the customers ID code is detected, in this case by an optical barcode reader. The ID may also be detected by any other means such as radio frequency detection. This tells the store computer which particular customer has entered the store. The store computer then sends offers of interest to the particular customer on their pager, where they may view the offers. The customer
30 may then select promoted product(s) or service(s) and take them to the check-out counter. The customer may then scan the pager barcode or store member card at the register and

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receive promotion credits towards those products. These credits may be redeemed immediately or at a later date. The resultant data acquired from the customers use of this system is accumulated on the computer storage system. Now new and novel data, heretofore not available, can be aggregated, amalgamated, and analyzed. It is also within
5 the purview of this invention that questions may be asked of the customer, pertaining to products, services, etc., yielding important and valuable information. Answers to questions may be transmitted to the computer storage system. In this instance the pager will be of the two way communications type, which has recently become available. The new type of information, for example, may address how long it took the customer to purchase the
10 product after being paged with that promotion, how many additional products were also purchased, how long the customer stayed in the store, etc. This information has not been available because no such promotion system has existed before this new invention, capable of providing patron tracking on the premises. It is true that promotion announcements to the general personage are used presently, but without follow-up or correlation to a specific
15 customer with a specific individual promotion. That is, custom promotions can be offered to specific customers, without the participation of any other customer.

This new invention allows for "stimulus and response" studies with very carefully designed structures and criteria. The system is simple and unobtrusive, and may be operable in store environments that would not be receptive to other promotion methods.
20 For example, the major department stores would not provide coupons in the various departments as is done in food markets. Food markets are seen as utilitarian and coupons offered in the traditional manner are acceptable. In a department store such as Bloomingdales this type of activity would be seen as denigrating to the ambiance and quality or caliber of the stores presentation. Because of the personal manner in which this system
25 may be operated, customers may be addresses with "personal" attention, rather than en mass. This new approach to sales promotion may now be applied to all the various markets that have previously shied away from traditional methodologies.

Another considered use of operation is where while driving past various establishments having limited range transmitters on their premises, the pager may be
30 signaled to alert the driver. An example: driving within range of a Pizza Hut will cause the drivers pager to display the message "wouldn't you like a pizza right now --- your within

200 feet of Pizza Hut --- take one home for dinner". There can also be distinct levels of paging access, to provide blocking of undesired types of pages. An access level for "personal paging" may be separate from retail paging (Pizza Hut v.s. personal messages) allowing for the blocking of pages from many fast food establishments as you drive past them. All of the prior communications stated are site or local sorced signals. The pager device can receive communications from a standard provider such as "Skytel" containing personal messages simultaneously with site message signals, or without any messages from a local site.

The system design may be comprised of many different and distinct hardware and software arrangements designed to address unique requirements and environments. The first example of Fig. 1 shows a flow diagram of a simple system. The patron wearing this pager device passes between a set of stanchions containing a transceiver, represented by the "ID QUERY" block, to Inquire the ID of the Pager Device, provided by the Answer function. This Inquiry transmission is received and recognized by the "PAGER DEVICE" block, as a request for the Pager Device ID code. After the stanchion receives the Pager Device Answer, the code (patron ID) is sent to the retailers computer, "RETAILERS COMPUTER" block, causing the computer to locate the patrons member record in a member database stored in disk memory. When found, the computer sends that patrons record discount data to the transmitter, "RETAILER DISCOUNTS TRANSMITTER" block. The discounts are transmitted to the patrons pager device, "PAGER DEVICE RECEIVER" block, for display. At the same time messages may be received from a service provider, "STANDARD PROVIDER TRANSMITTER" block, by the PAGER DEVICE transmitter. A button may be provided to facilitate the patrons selection of displaying either the discounts or the messages.

Another version of the system is depicted in Fig. 2. This system requires the retailers receiver (located on the premises) to receive messages for the patron that originate from the standard provider. Just as in the prior system the ID selects the patron member record. The same ID is now used to receive any standard provider messages for that patron. When a message is received by the Retailers Receiver block the message is appended to the last set of discounts, as a further transmission. This causes the pager device to alert the patron to "messages" versus discounts with a distinct alarm of some kind,

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possibly a light or sound. The messages may be viewed on the Pager Device display by way of pressing a display button, selecting either the discounts or messages. Additionally, the discounts and messages may be multiplexed together as described later in this text.

Simultaneous Reception

5 A very important aspect to this novel invention is that in order to receive the patrons personal messages and discounts, the Pager Device must simultaneously receive the retailers discount transmission and the standard service providers transmissions of personal messages. The following description addresses some of the potential methods that this invention may provide for the reception of two sources of transmitted information (and a
10 third ID query) to be received by the Pager Device. There are three methods presented in this document but these are for example only and are not to be limiting to just these methods, any suitable method may be utilized to achieve similar results.

TECHNICAL DESCRIPTIONS

Dual Receiver System

15 A method, where the two data transmissions are received by two distinct receivers within the Pager Device, as depicted in Fig. 3. The operational system is depicted by the of Fig. 1.

 When the patron wearing this pager device passes between a set of stanchions containing a transceiver, represented by the "ID QUERY" block of Fig. 1, an ID Inquire
20 is transmitted to the RECEIVE SIGNAL RETAILER block to the Pager Devices RETAILER RECEIVER & BUFFER block to the "ID QUERY DETECT" block of Fig. 3. This activates the pager device ID function of the "FIRMWARE" block, sending the pager ID code to the "ID TRANSMITTER" block of Fig. 3. This ID code Answer transmission is received by receiver section of the transceiver, of the "ID QUERY" block
25 of Fig. 1, contained within the stanchions.

 After the stanchions receive the pager device ID (patron ID) code response from the pager device, the ID code is sent to the retailers computer, "RETAILERS COMPUTER" block of Fig.1, causing the computer to locate the patrons member record in a member database stored in disk memory. When found the computer sends that patrons
30 record discount data to the retailers transmitter site, RETAILER DISCOUNTS TRANSMITTER block of Fig.1. The discount data is transmitted to the patrons pager

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device "PAGER DEVICE" block of Fig. 3, for reception by the pager device. The retailers discount data transmission at the "RECEIVE SIGNAL RETAILER" block of Fig. 3 enters the receiver within the Pager Device, and is capable of receiving the retailers transmissions of the rewards and incentives at retailers "RECEIVER & BUFFER" block, for display.

- 5 The signals from the "RECEIVE SIGNAL PROVIDER" block is accepted at the other receiver provider "RECEIVER & BUFFER" block for processing of the standard providers transmissions, including personal messages, for display. This method may require a switch be employed in the "BUFFER SELECT" block of Fig. 3, providing for display of either receivers messages alternately. Other means of hardware and firmware may be employed
- 10 to combine both receivers messages on to one display. This may incorporate combining of two receiver buffer memories into one with display of one set preceding the other facilitated by codes embedded within the messages. These codes may provide for the firmwares use of indexes to provide separation of the messages into two groups. These methods of separation are known by one skilled in the art and are for example only.

15 Separate Receiver System

- A system depicted in Fig. 2 where the two data transmissions are received by one distinct receiver systems on different frequencies, one is within the pager device (Fig. 4) and the other is at the retailers fixed site with the system member and discount computer. The receiver within the pager device is capable of receiving the retailers
- 20 transmissions of rewards and incentives and appended messages, for separate display. The site receiver receives the standard providers transmissions of personal messages, these messages are stored in appropriate memory such as a hard disk. At an appropriate time (after ID request) the messages are "relayed" or retransmitted by a fixed site transmitter (at a different frequency than received) to the receiver within pager device.
- 25 When the patron wearing this pager device passes between a set of stanchions containing a transceiver, represented by the "ID QUERY" block of Fig. 2, to activate the pager device ID function. This transmission is received by "RECEIVED SIGNAL RETAILER, ID & APPENDED PROVIDER MESSAGES" block of Fig. 4 and recognized by the "RECEIVER & SMART BUFFER" block. The receiver sends the inquiry to the "ID
- 30 QUERY DETECT" block which triggers the "FIRMWARE" block to send the pager device

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ID code to the "ID TRANSMITTER", to be transmitted to the stanchions containing the transceiver of Fig. 2.

After the stanchions receive the pager device ID (patron ID) code response from the pager device the ID code is sent to the retailers computer, "RETAILERS
5 COMPUTER" block of Fig. 2, causing the computer to locate the patrons member record in a member database stored in disk memory. When found the computer sends that patrons record discount data to the retailers site transmitter, "RETAILER DISCOUNTS TRANSMITTER" block of Fig. 2. The patrons record discount data also has provider messages appended. The total data is transmitted to the patrons "Single Receiver" type
10 Pager Device Fig. 4, for reception. As depicted in Fig.4, this transmitted signal enters at "RECEIVED SIGNAL RETAILER, ID & APPENDED PROVIDER MESSAGES". The signals enter the receiver "RECEIVER & SMART BUFFER" block. The term "SMART BUFFER" pertains to a firmware managed buffer for recognizing the ID from the discount and message data, and is functional only during the request for ID code.

15 Single Mux Receiver

A method where the two data transmissions are received by one receiver within the pager device as depicted by system operations Fig. 5. This figure is identical to Fig. 2 except for the appended message transmission path between the "RETAILER DISCOUNTS TRANSMITTER" block and the "PAGER DEVICE" block. The receiver
20 within the pager device is capable of receiving retailers transmissions of the rewards and incentives and standard providers transmissions, including personal messages. In this method the pager device requires only one receiver but incorporates a "signal de-multiplexer" or decoder. This de-multiplexer separates two data sources that were combined at the point of transmission. There are many types of systems, some called "stat-
25 mux", utilizing static processing. These systems combine two separate data messages into a single transmitted signal source. Other methods are possible where two transmissions on the same transmission frequency are able to be discerned, and their individual data extracted.

This method of two signals being transmitted on a single frequency with
30 simultaneous reception is provided by Kintel Technologies Inc. Of Salinas CA. Kintel can separate the signals of two FM voice or data calls carried simultaneously in the same

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channel, through a process they call power multiplexing. This method is very cost effective due to the Pager Device being very simple in design and requiring only one receiver.

With proper approval from the licensed provider the pager device can utilize their allotted frequency channels to transmit and receive the ID query and discounts, all on the same

5 pager device single channel.

Total Message Capability

The capabilities of the present patent are unique and comprehensive. The Pager Device can receive two or more personal (standard provider) or discount (local, store provided) datum signals due to the circuit design, two or more receivers or singular

10 MUXed receiver. In the basic design one channel is for the ID data, the second channel is for the Discount Data. These signals are provided by the local site system. The third channel is for the reception of personal messages from the standard service provider (Comcast, SkyPage). It is the intent of this invention to provide a paging device capable of receiving two or more signals simultaneously and being capable of displaying this data

15 on a single display or multiple displays. This affords the standard service provider's messages to be uninterrupted by any other message signals being received by the pager device. This is of extreme importance in that the personnel messages may be of an urgent matter, such as those messages that a doctor might receive. This also applies to the discount data, the patron must not loose any of the opportunities that are offered as part of

20 the service. It is also conceivable that security such as but not limited to personal identification number (PIN) codes or security devices providing authentication of a user for receipt of secure messages, or for approval of charges on purchases may be transacted by the pager device's transceiver capabilities. Any security means may be provided, such as a finger print reader may be incorporated to further address authentication of financial or

25 other transactions. Such a finger print capability is available from various sources such as CardGuard International, Inc. and by Thomson CSF Semiconducteurs Specifiques, and is understood by one skilled in the art.

While the invention has been described and illustrated with reference to specific embodiments, those skilled in the art will recognize that modification and variations

30 may be made without departing from the principles of the invention as described herein above and set forth in the following claims.

Claims**What is claimed is:**

1. A system for providing information to a subscriber, said system comprising:
 - a memory for storing information relative to said subscriber;
 - a detector for detecting the presence of said subscriber at a location; and
 - a transmitter for transmitting information stored in said memory to said subscriber at said location in response to the detection of said subscriber.
2. The system of claim 1, wherein said detector detects the presence of said subscriber entering a transactional establishment.
3. The system of claim 1, wherein said detector detects the presence of said subscriber in the vicinity of a particular transactional item.
4. A system for providing transactional information to a subscriber, said system comprising:
 - a memory for storing transactional information relative to said subscriber;
 - a detector for detecting an inquiry generated by said subscriber; and
 - a communicator for communicating transactional information stored in said memory to said subscriber in response to the detection of said inquiry.

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SIPS

BASIC RETAILER SYSTEM

This is an example of a SIPS system operation. The promotional information flows in one direction to the consumer. Multiple incentives are possible one at a time or all at once on a capable display.

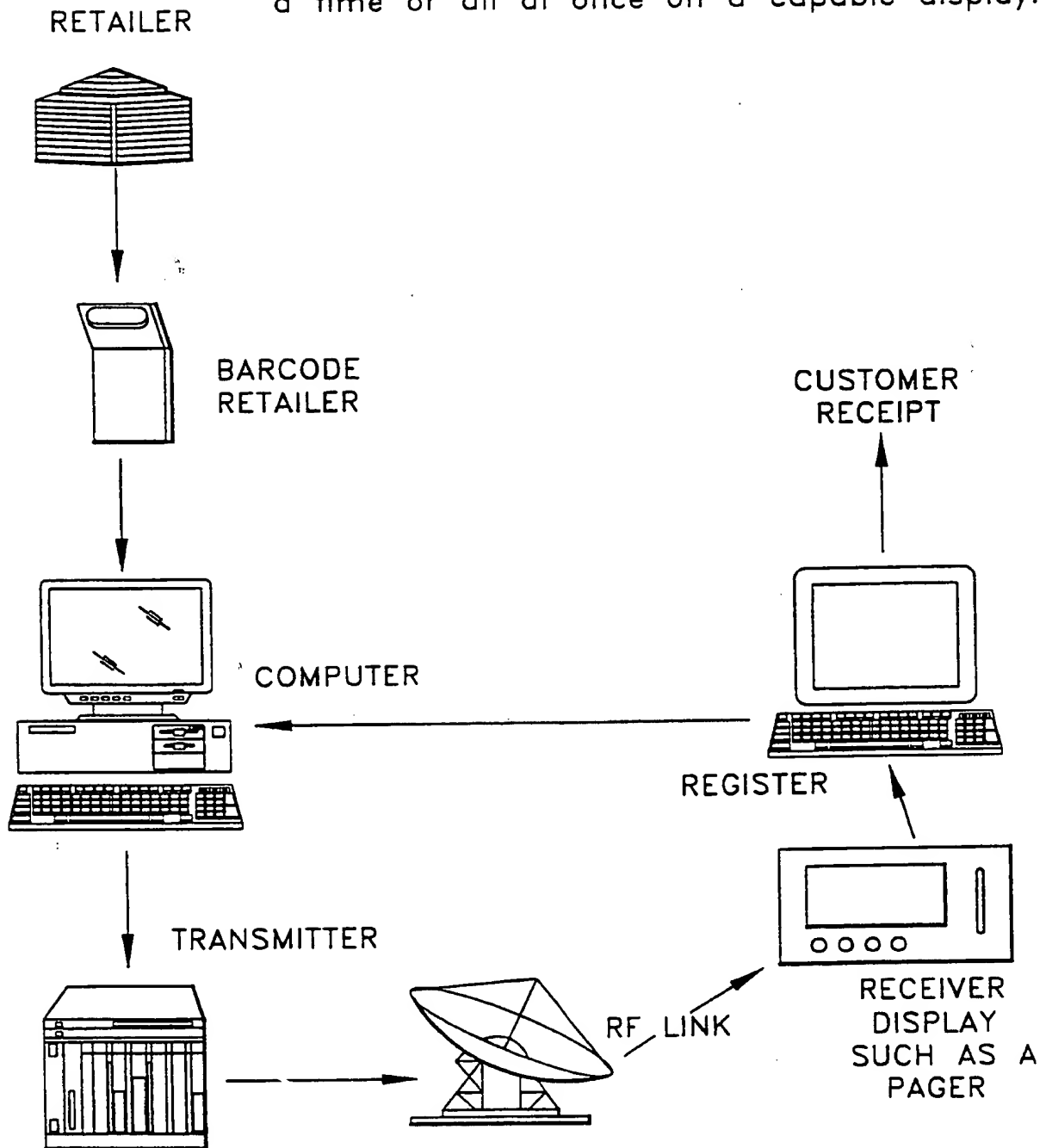


FIG. 1

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SIPS FLOW DIAGRAM
BASIC
MULTI-SYSTEM

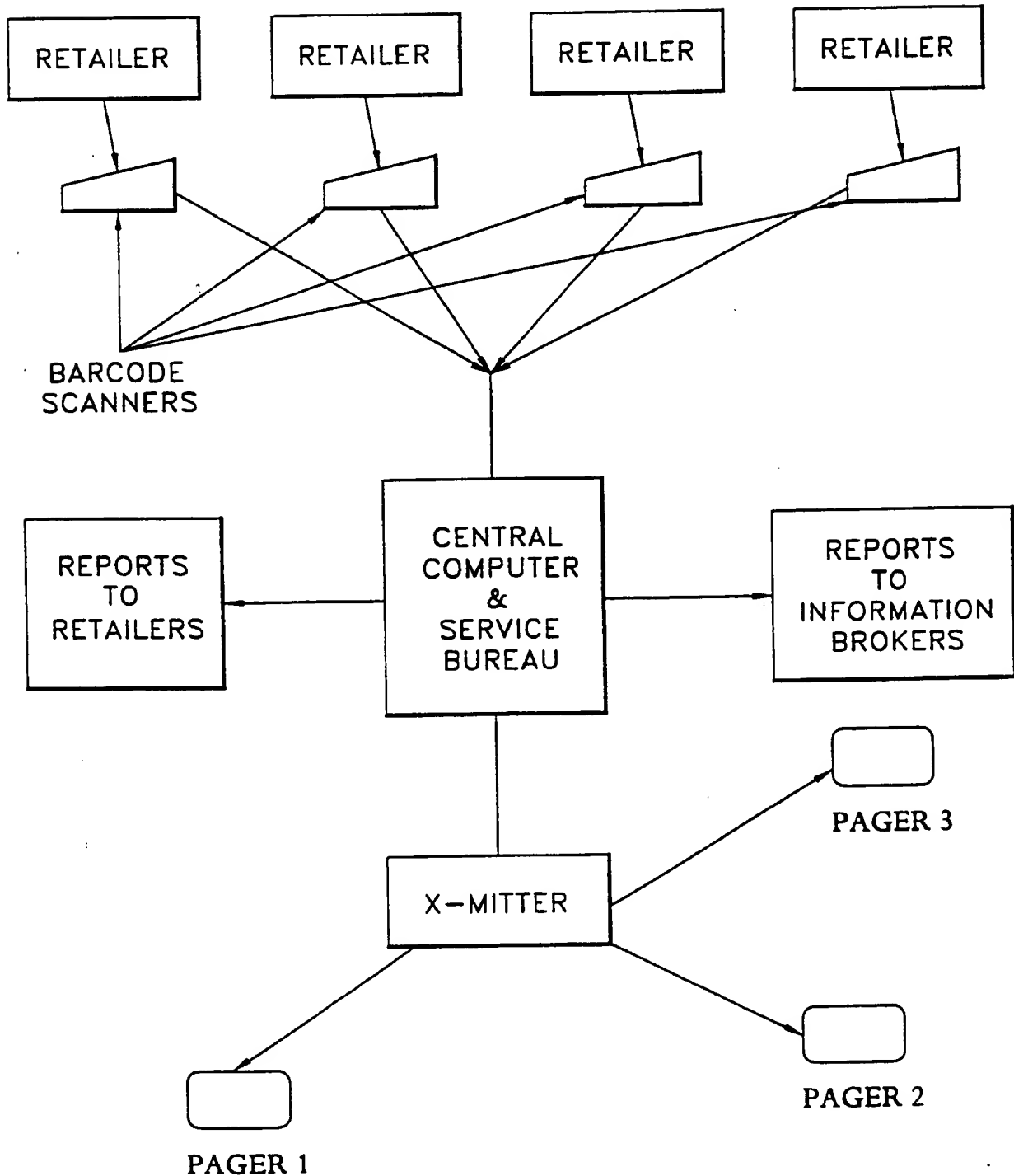


FIG. 2a

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SIPS FLOW DIAGRAM
COMPLEX
MULTI-SYSTEM

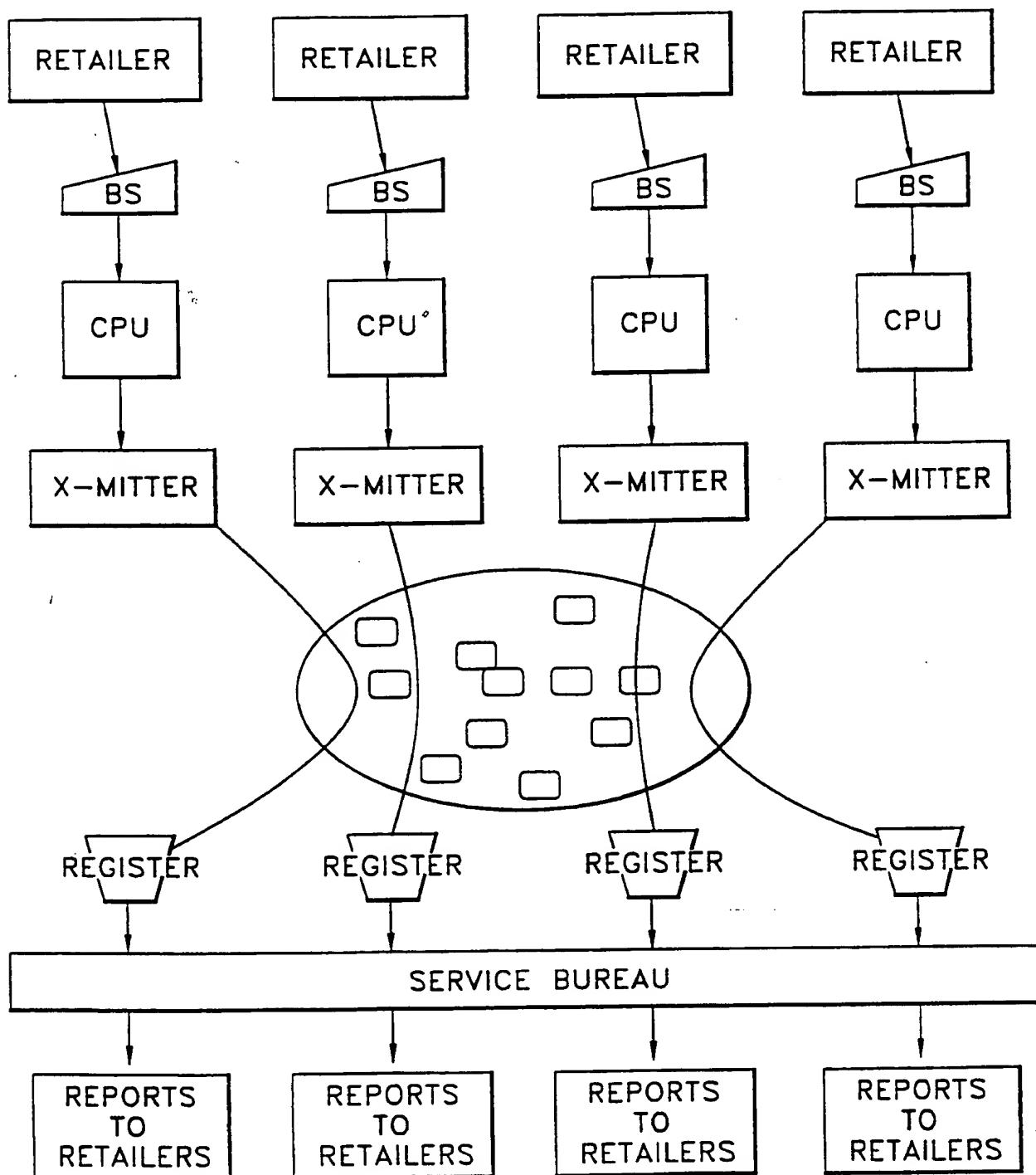


FIG. 2b

4/10
SIPS FLOW DIAGRAM
BASIC
MULTI-FUNCTION SYSTEM

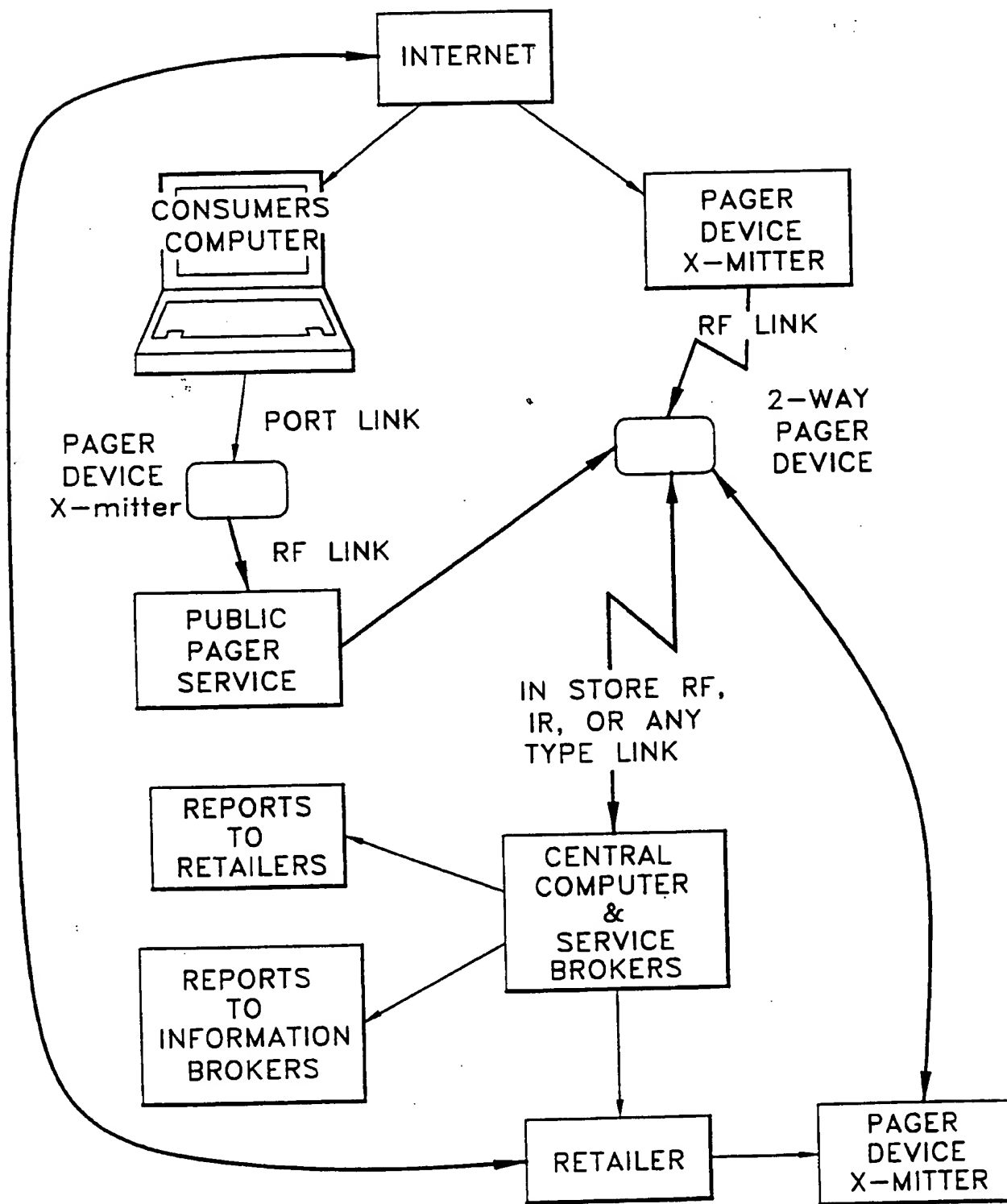


FIG. 3

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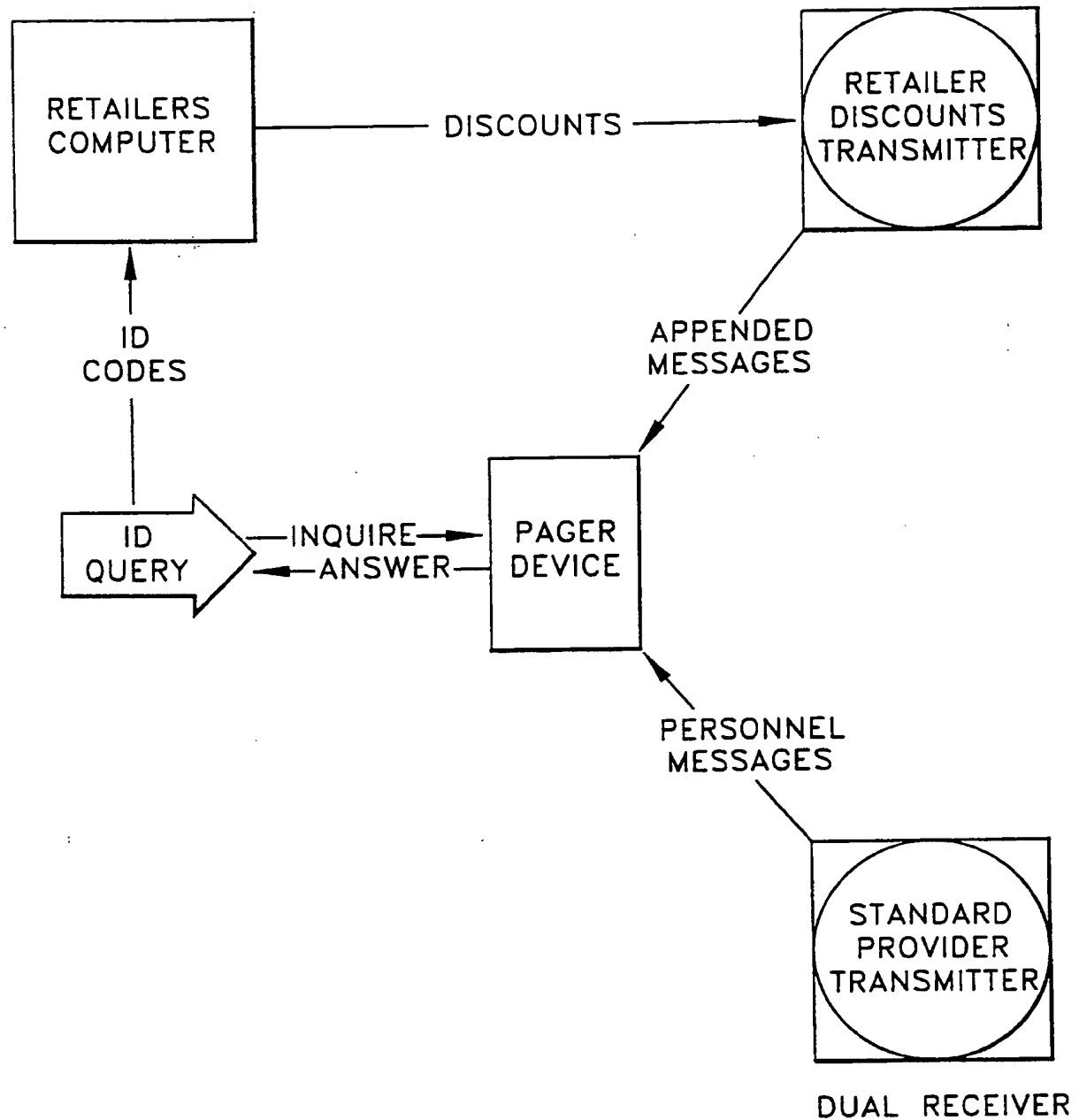


FIG. 4

System Site

6/10

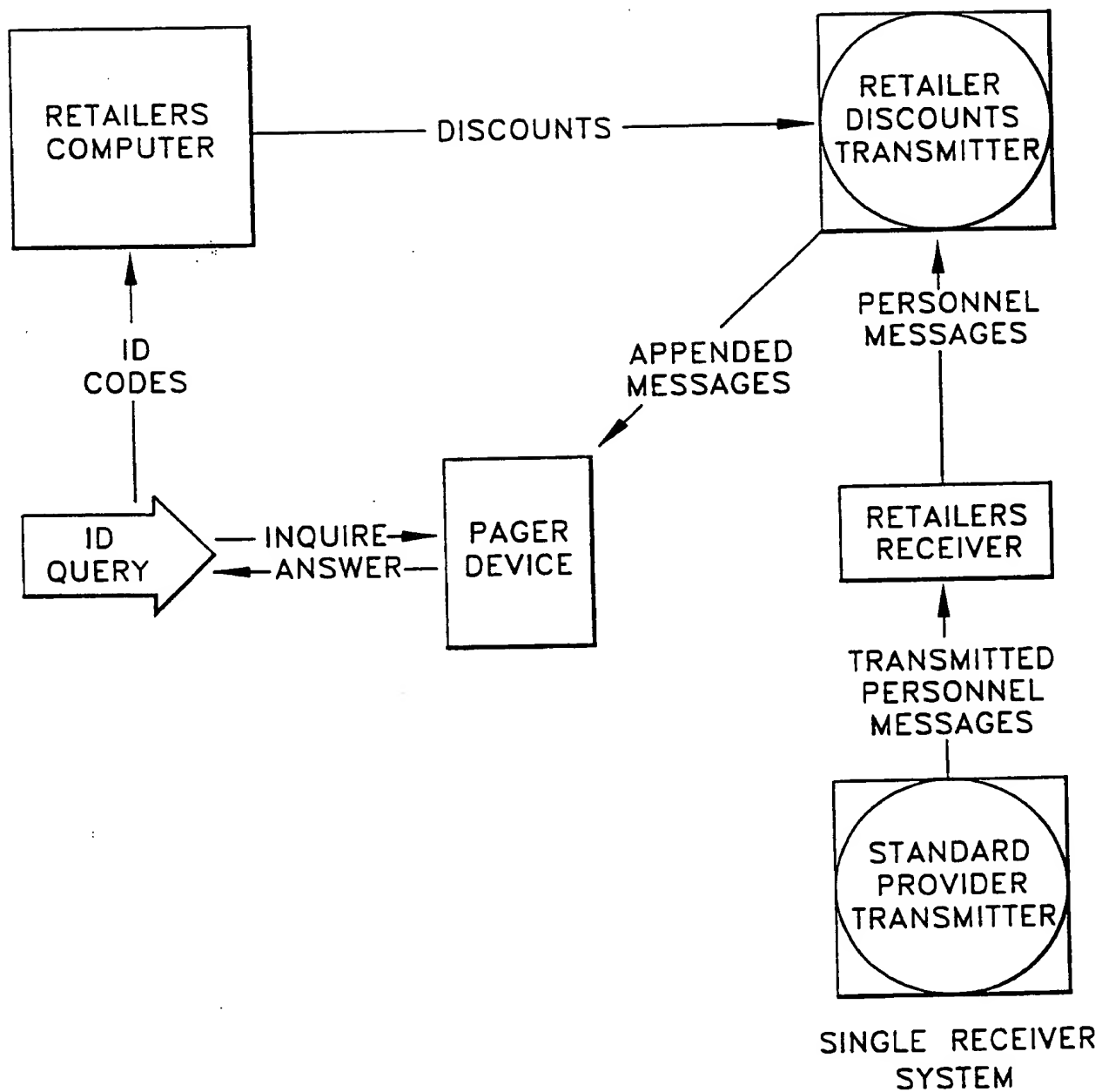
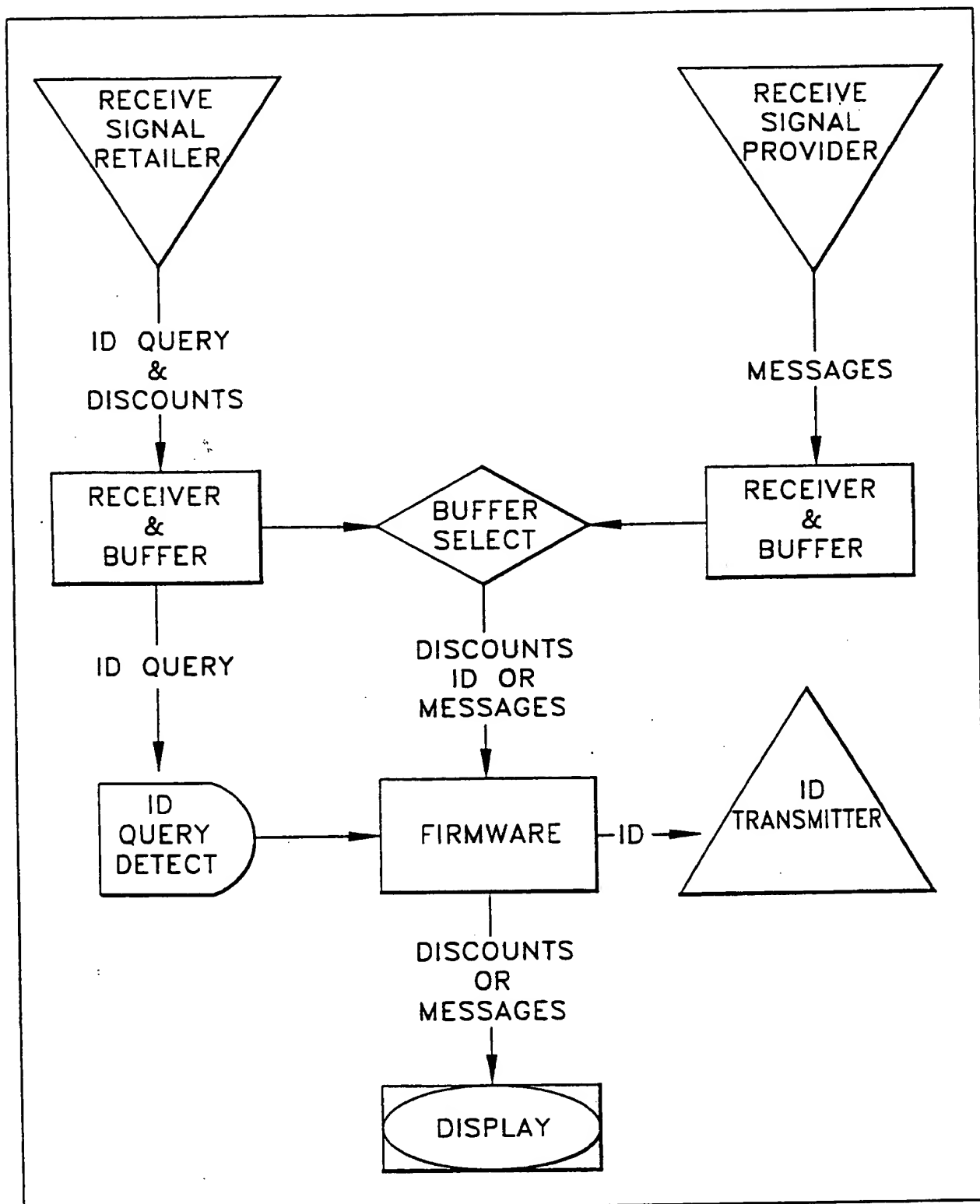


FIG. 5

SITE

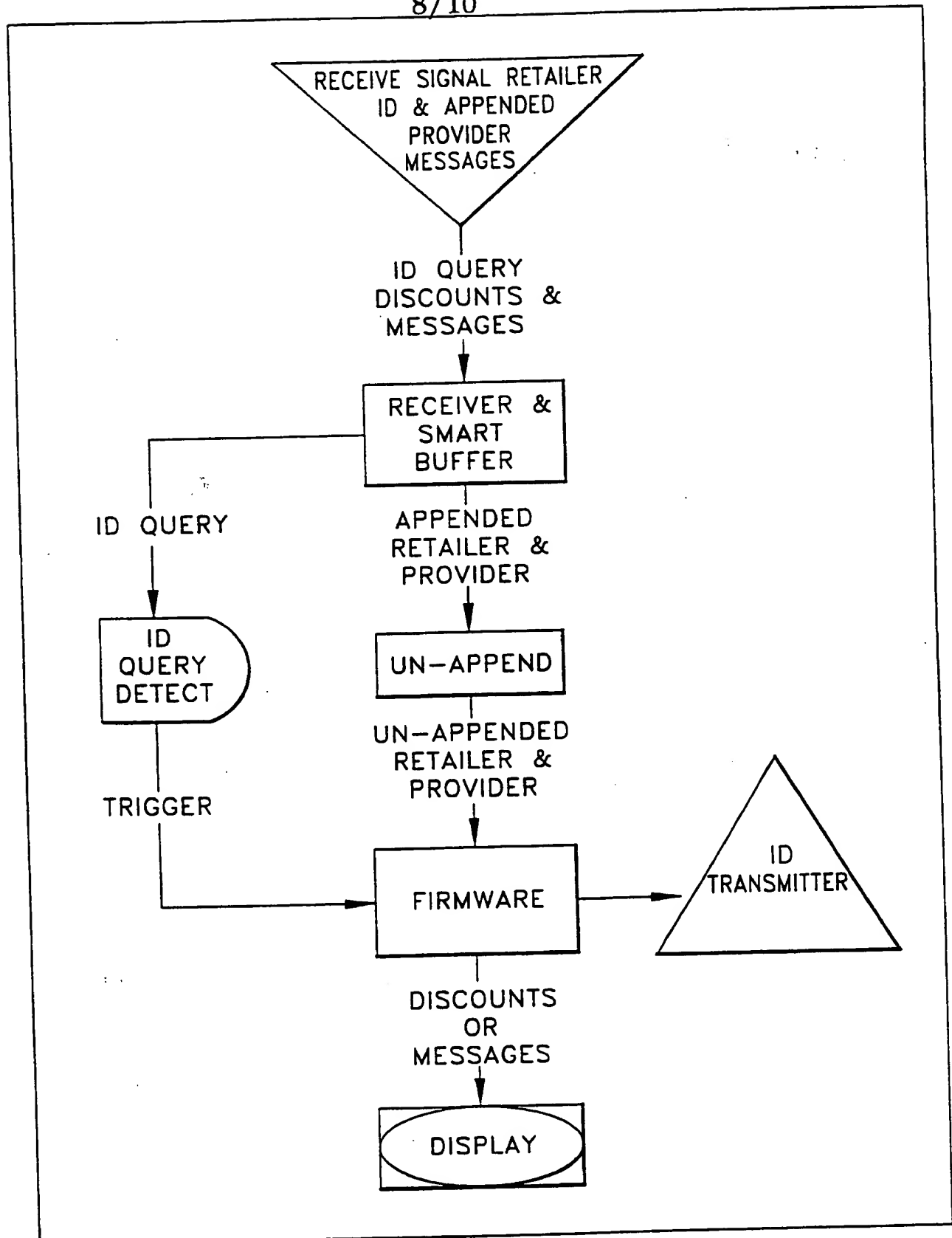
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Pager Device (dual receiver)

FIG. 6

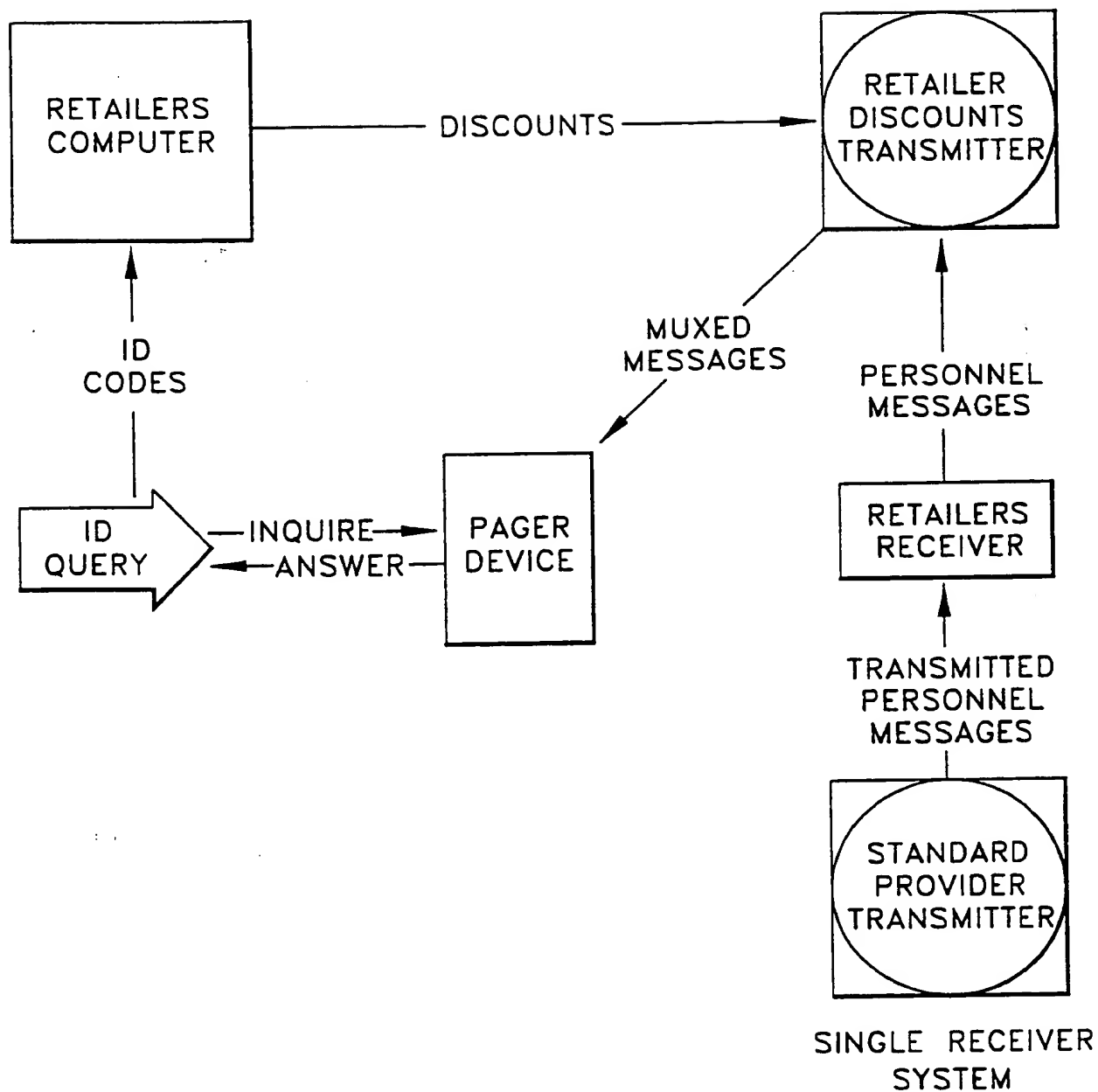
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Pager Device (single receiver)

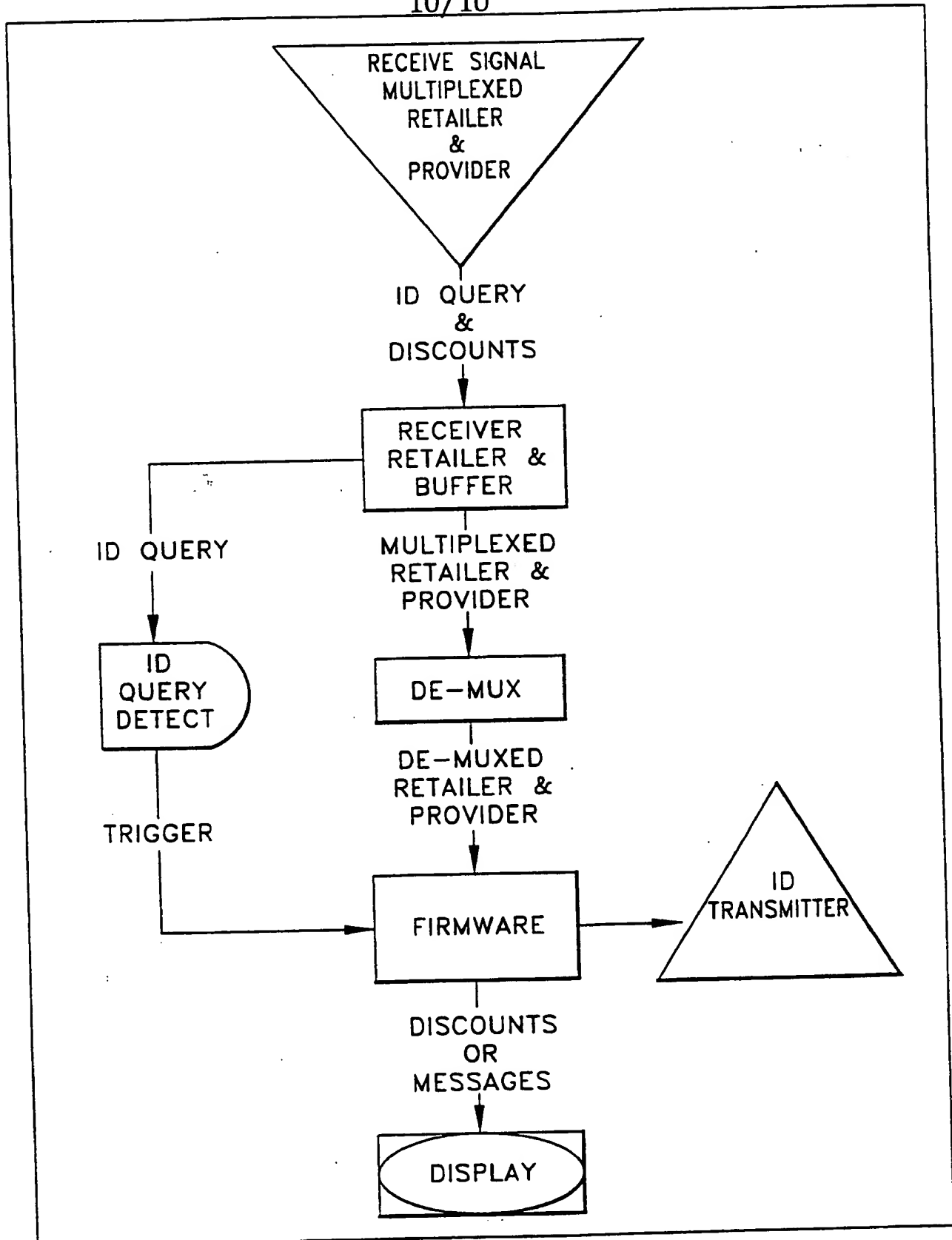
FIG. 7

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**FIG. 8**

Single MUX Receiver System Site

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Pager Device (single MUX receiver)

FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US98/25870

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06K 15/00

US CL :705/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/14, 1; 235/383

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS search terms: customer, pager, wireless, radio, transceiver

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A,E	US 5,859,414 A (GRIMES et al.) 12 January 1999, abstract, summary	1-4
Y,P	US 5,821,513 A (O'HAGAN et al) 13 October 1998 abstract, summary, figs. 7,9 col. 9, line 1 - col. 10, line 62	1-4
A	US 5,406,271 A (SONNENDORFER et al) 11 April 1995, abstract, summary	1-4
Y	US 5,295,064 A (MALEC ET AL) 15 MARCH 1994 abstract, summary	1-4



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
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L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

10 FEBRUARY 1999

Date of mailing of the international search report

22 MAR 1999

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